To gain relevant context in regards to what this paper is demonstrating, it is important to take into account a recent study published in Nature Communications in March of 2024, roughly 5 years after this idea was first introduced to the public. In that study published in March of 2024, researchers discovered that Mars is exerting a gravitation pull on earth's tilt, exposing earth to warmer temperatures and more sunlight, all within a 2.4 million year cycle. I assert that this allows us to surmise that, even within smaller timeframes, Mars is still exerting a gravitational pull on earth's axial tilt, enough to raise temperatures when Mars travels behind the sun or lower temperatures when it travels in front of the sun, from earth's point of view. This would affect rainfall if other dynamics trigger the temperature perturbations conducive to precipitation



New evidence for an unexpected player in Earth's multimillion-year climate cycles: the planet Mars

Published: March 12, 2024 3:14pm EDT

Dietmar Muller

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Our existence is governed by natural cycles, from the daily rhythms of sleeping and eating, to longer patterns such as the turn of the seasons and the quadrennial round of leap years.

After looking at seabed sediment stretching back 65 million years, we have found a previously undetected cycle to add to the list: an ebb and flow in deep sea currents, tied to a 2.4-million-year swell of global warming and cooling driven by a gravitational tug of war between Earth and Mars. Our research is published in Nature Communications.

Authors

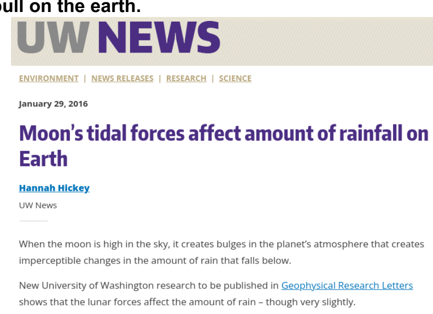
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Back in 2014, two scientists from the University of Washington studied climate data spanning 15 years and discovered that lunar tallies affect rainfall. Tsubasa Kohyama and his professor John Wallace studied rainfall data spanning 15 years between 1998 and 2012 and found that the position of the moon when it is overhead from our vantage point standing on earth or under foot, air pressure increases, which leads to elevated temperatures, more absorbed moisture and less rainfall. However, the effect was only 1% of all rainfall variations but the data was significant enough to link the position of the moon with rainfall. At rising or setting from our vantage point, rainfall should theoretically be higher. But at the meridian, according to the study, the moon decreases rainfall. The science behind this study is that the moon's gravity pull's earth's atmosphere higher, increasing air pressure. When this happens, the air beneath becomes warmer and able to absorb more moisture. This study allows us to use the position of the moon as our rainfall trigger.

In addition, with the moon understood as having a stabilizing effect on earth's wobble, we can point to the position of the moon relative to Mars as being a momentary adversarial influence against Mars's gravitational pull upon earth's axial tilt, in that when the moon lines up opposite to Mars, it can momentarily shift temperatures away from the current trend that is fostered by Mars's gravitational pull on the earth.



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January 29, 2016

Moon's tidal forces affect amount of rainfall on Earth

Hannah Hickey
UW News

When the moon is high in the sky, it creates bulges in the planet's atmosphere that creates imperceptible changes in the amount of rain that falls below.

New University of Washington research to be published in Geophysical Research Letters shows that the lunar forces affect the amount of rain – though very slightly.

With this new understanding about the revolution of Mars around the sun and its link to earthly climate patterns and human behavior, we can surmise how this dynamic would play out when it comes to predicting precipitation. The basic premise of precipitation is that warmer air is able to hold onto moisture/water vapor until cooler air comes in and causes the water vapor to undergo a process called condensation, which turns water vapors into liquid droplets or what we know as rain. Understanding how Mars can create the conditions for rain will help us to predict precipitation events much more efficiently. So far, it has been posited that when Mars travels behind the sun, from earth's point of view, its gravitational pull on the earth's axial tilt can expose the earth to more sunlight and warmer temperatures. When Mars travels in front of the sun, from earth's point of view, it's gravitational pull on earth's axial tilt, pulls earth away from the sun, which should trigger less sunlight, less heat and more cooling. With these aspects in mind, we can apply this dynamic to the seasons in which this happens, which would thus allows to predict when warmer air will mix with cooler air or vice versa and create the conditions for moisture to precipitate out and become rainfall.

Here is an example of what I mean. The warmer months in a calendar year are spring and summer which starts around March 20 and lasts until September 20. We can maintain as a constant that this time of the year will have more moisture in the air and less rain, unless afflicted by the Mars variable, such that if Mars is traveling behind the sun during this period, increasing the earth's exposure to sunlight and warmth, it could be expected that rainfall will be less, allowing us to predict that spring and summer that year will be drier. If it's the other way around, that Mars is traveling in the front of the sun during the spring and summer, pulling earth's tilt away, exposing earth to less sunlight and more cooling, we can surmise that the spring and summer will have more precipitation since cooler air brought on by this Mars's configuration will mix with the warmer spring and summer air and create the conditions for precipitation.

This dynamic would also apply when it comes to cooler months, fall and winter between September 20 and March 20th. If Mars is traveling behind the sun during the winter, the warmer air from this will mix with the cooler and create the conditions for precipitation. If Mars is traveling in front of the sun during this period, more cooler air will result with less chance for precipitation.

We can also factor in Mars within 30 degrees of the lunar node as a factor that can exacerbate the conditions for rainfall by pulling and stretching the moon's orbital plane, bringing the moon further away from earth, which has a destabilizing effect on earth's wobble.

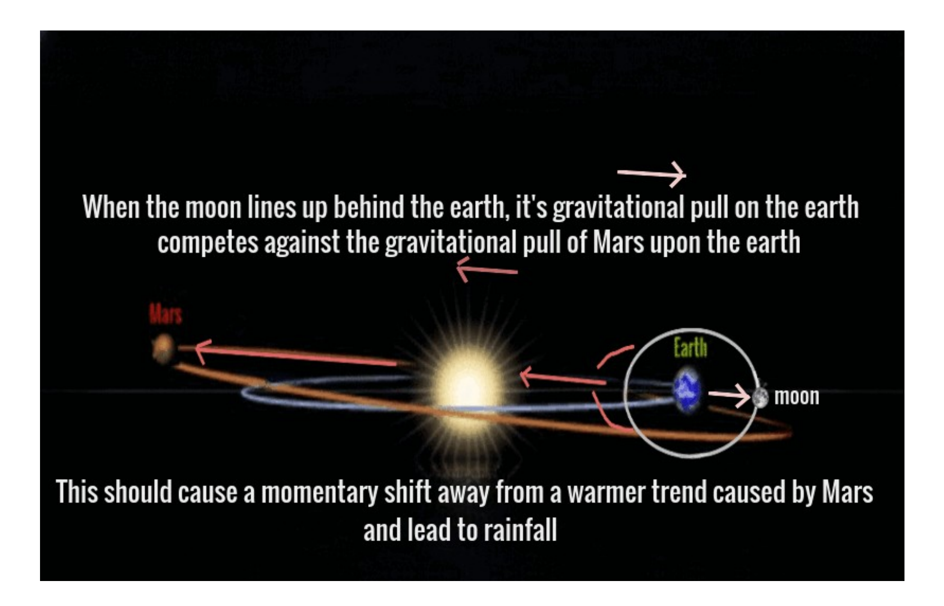
With this theoretical framework, we can apply the conditions necessary to trigger actual rainfall. Presuming a period of higher rainfall or lower rainfall based on Mars position relative to earth and the season at the time doesn't provide an actual mechanism that could trigger rainfall. We thus have to envision an scenario where cooler and warmer air will mix in a given period. Lets say that we have Mars traveling behind the sun, during the winter, creating the a scenario for a warmer

winter as Mars's gravity pulls earth's axial tilt during this period. In this regard, we can posit that there would be more rain rather than snow during this period. However, we still need to interpolate a scenario where warmer air will mix with cooler air. If this scenario of Mars traveling behind the sun during winter predicts a warmer winter, then in order for there to be rain during that season, a mechanism that brings in cooler air would need to be explained. We can thus insert the lunar scheme.

Back in 2014, two scientists from the University of Washington studied climate data spanning 15 years and discovered that lunar tallies affect rainfall. Tsubasa Kohyama and his professor John Wallace studied rainfall data spanning 15 years between 1998 and 2012 and found that the position of the moon when it is overhead from our vantage point standing on earth or under foot, air pressure increases, which leads to elevated temperatures, more absorbed moisture and less rainfall. However, the effect was only 1% of all rainfall variations but the data was significant enough to link the position of the moon with rainfall. At rising or setting from our vantage point, rainfall should theoretically be higher. But at the meridian, according to the study, the moon decreases rainfall. The science behind this study is that the moon's gravity pull's earth's atmosphere higher, increasing air pressure. When this happens, the air beneath becomes warmer and able to absorb more moisture. This study allows us to use the position of the moon as our rainfall trigger.

In addition, with the moon understood as having a stabilizing effect on earth's wobble, we can point to the position of the moon relative to Mars as being a momentary adversarial influence against Mars's gravitational pull upon earth's axial tilt, in that when the moon lines up opposite to Mars, it can momentarily shift temperatures away from the current trend that is fostered by Mars's gravitational pull on the earth. If we are in a warmer than usual season because Mars is traveling behind the sun, pulling earth's axial tilt toward the sun, we can posit that when the moon lines up opposite to Mars, but behind the earth, we can predict that the moon's gravity pulling the earth's tilt away from the sun will cause a momentary shift in temperatures, which would create the conditions for cooler air to mix in with warmer air and break apart water vapors, allowing water to precipitate out and become rain.

Here is a general idea on how to envision this scenario causing rain.



In the image, we see the conditions that could lead to moisture and water vapor absorbed during the warmer trend, later becoming precipitation as the moon interrupts the warmer trend by trying to oppose Mars's gravitational pull and bring earth's tilt away from the sun. This would be momentary, over the course of 1-5 days since the moon travels much faster around the earth than Mars does around the sun.

Now keep in mind there are many variations of this dynamic that could trigger rainfall. For instance, Mars traveling in front of the sun during a summer, thereby causing lower than average temps as Mars's gravity pulls earth's axial tilt away from the sun, could be met with opposition when the moon travels in front of the earth, which would create conditions for precipitation since the moon's gravitational influence on the earth, pulling the earth toward the sun, could interrupt a cooler trend. Warm air would merge with the cooler air, leading to the break up of water vapors. Here is an example that represents such a scenario.

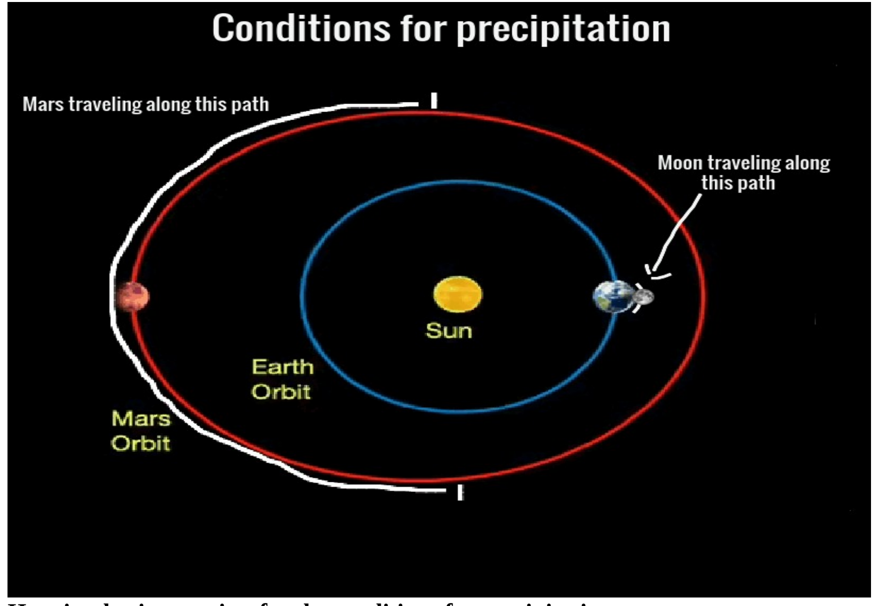
As Mars pulls earth's axial tilt away from the sun, the moon's gravity pulls earth's tilt back towards the sun

moon

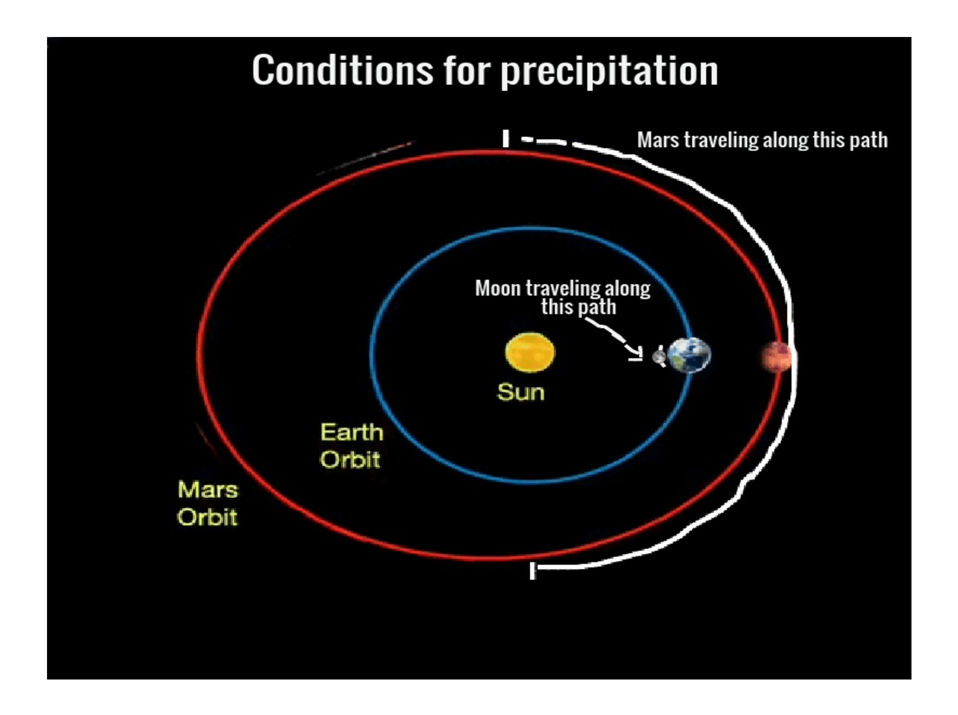
Earth

Mars

This should lead to a momentary shift away from a cooler trend caused by Mars, and lead to rainfall



Here is a basic overview for the conditions for precipitation



These first two examples interpolate how rain can be fostered by this alignment, and narrows down the parameters that could trigger rainfall. We can now narrow things down further and insert the notion that the closer the alignment at opposition between the moon and Mars, the more likely heavy rain will come about. So now lets narrow down the required path of the moon and Mars.

Conditions for precipitation

Mars traveling along this path

Moon traveling along this path

Sun

Earth Orbit

Mars Orbit

Conditions for precipitation

Mars traveling along this path

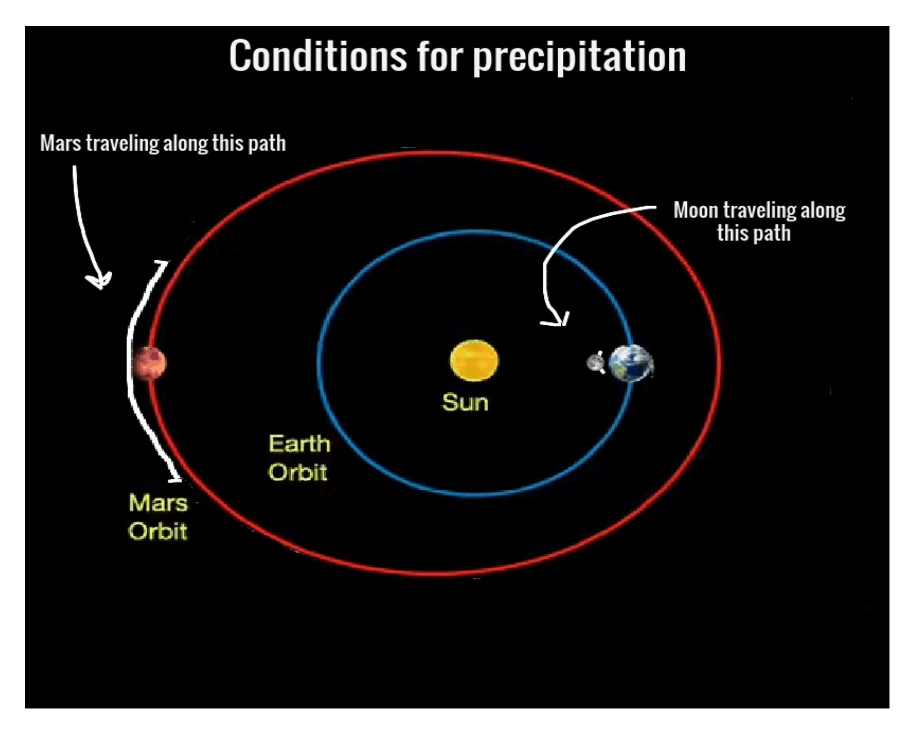
Moon traveling along this path

Sun

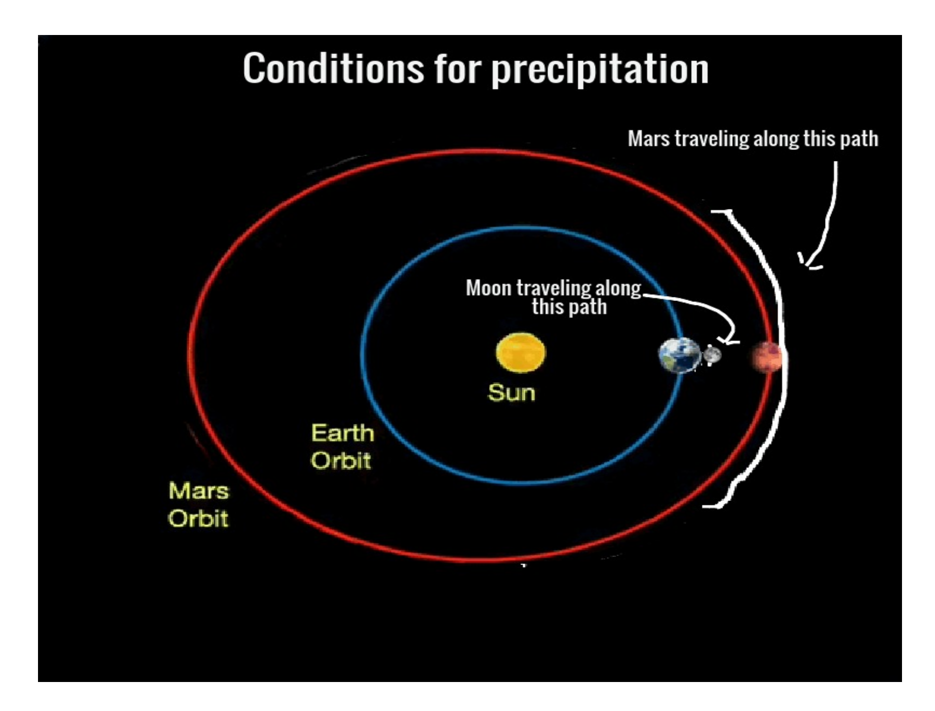
Earth Orbit

Mars Orbit

With these narrowed down, we can delve into the other two variations which can also be applied to precipitation science, which involve a close conjunction between the moon and Mars. If the moon is traveling in front of the earth, while Mars is traveling behind the sun, then both bodies in conjunction would be pulling earth's axial tilt toward the sun, exposing the earth to more sunlight and warmth. Here we can make the assumption that the warmer temperatures that result could lead to precipitation as the warm front mixes with the less warmer air, which could lead to the break down of water vapors. Here is an example of this close conjunction.

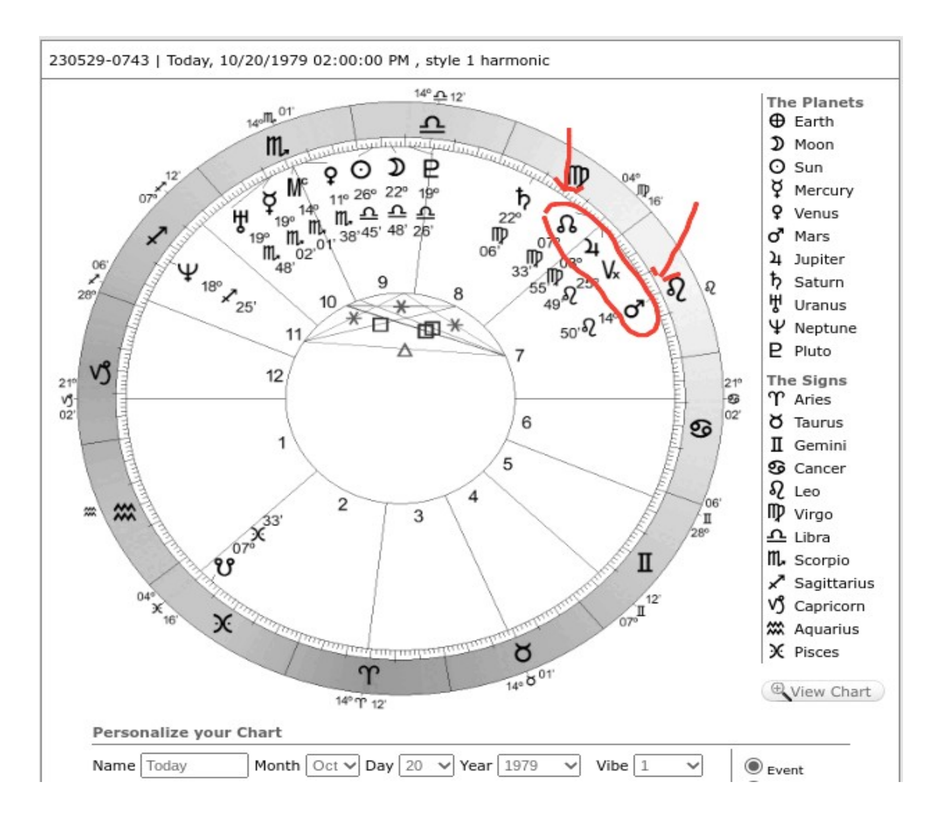


Now onto a visual of the other close conjunction between the moon and Mars, by which the moon is traveling behind the earth, while Mars travels in front of the sun, relative to earth's view point. Both bodies would be applying a gravitational pull upon the earth's tilt, bringing the earth away from the sun and exposing earth to cooler temperatures. Should the resulting cool front temperatures mix with the less cooler air, a break up of water vapors can occur and precipitation can result. Here is a visual of this scenario



We have now thus far laid out a theoretical framework that could alow us to predict temperature perturbations leading to rainfall by way of both Mars's and the moon's gravity acting upon the earth, in either shifting the earths axial tilt towards and/or away from the sun. However, since this paper has delved into extreme events, as elucidated in the first two sections regarding Gaza rocket fire and Stock market crashes, we should continue on that subject matter and investigate the extreme precipitation events. Much like escalated rocket attacks from Gaza and stock market crashes, we should find a similar theme of Mars being within 30 degrees of the lunar node being a precipitating factor that could trigger extreme precipitation events. Mars within 30 degrees of the lunar node has been explained as a mechanism by which the planet Mars applies a gravitational pull on the orbital path of the moon, stretching it, such that it incrementally brings the moon's orbit further away from earth, a factor that would have a destabilizing effect on earth's wobble, which would expose to earth to wilder temperature fluctuations. If we apply this dynamic to weather events, we can surmise that the scenario could cause major temperature perturbations that can condense water vapors absorbed by the air, triggering rainfall. The moon is factored into this since it is the component that prompts short term temperature perturbations. Keep in mind that we are attempting to explain extreme events. Here is a visual of how the configuration works. This first example is an extreme precipitation event in the Middle East, which occurred in 1979 from October 20th to October 23rd. Fifty people died, and 66000 were affected. Observe the chart and notice that Mars was within 30 degrees of the lunar node and applying

the aforementioned gravitational factors. Mars is also behind the sun relative to earth, so it had presumably been a warmer winter.



So now the perturbation was triggered by the moon. But pay close attention. I discovered a pattern that indicates that extreme precipitation events can be triggered by right angles between Mars and the moon, if either mass within 30 degrees of the lunar node. So if Mars is within 30 degrees of the lunar node, the temperature perturbation and corresponding precipitation will be triggered when the moon forms a near right angle to the position of Mars. Likewise, if the moon is within 30 degrees of the lunar node, the temperature perturbation can be triggered if the moon is already forming near a right angle to Mars. The former is happening here-Mars is within 30 degrees of the lunar node, while moon at a near right angle to Mars is triggering the temperature perturbation required for extreme precipitation. Here is the visual

230529-0743 | Today, 10/20/1979 02:00:00 PM , style 1 harmonic

The Planets
⊕ Earth
☽ Moon
☉ Sun
☿ Mercury
♀ Venus
♂ Mars
♃ Jupiter
♄ Saturn
♅ Uranus
♆ Neptune
♇ Pluto

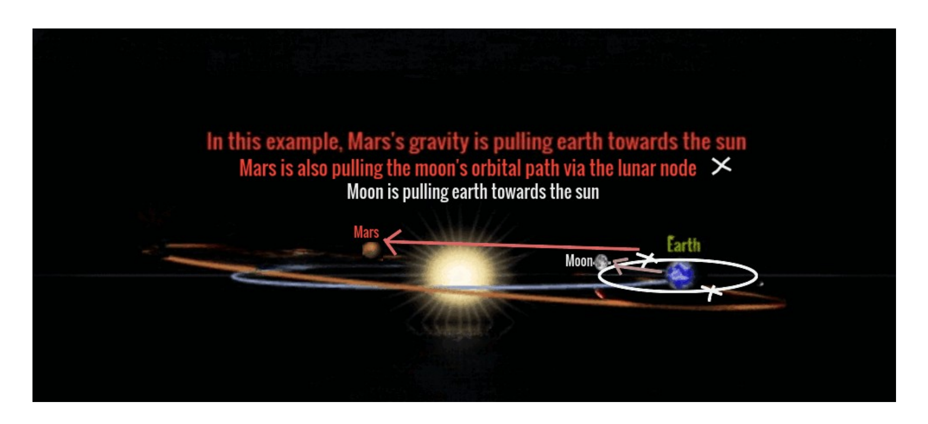
The Signs
♈ Aries
♉ Taurus
♊ Gemini
♋ Cancer
♌ Leo
♍ Virgo
♎ Libra
♏ Scorpio
♐ Sagittarius
♑ Capricorn
♒ Aquarius
♓ Pisces

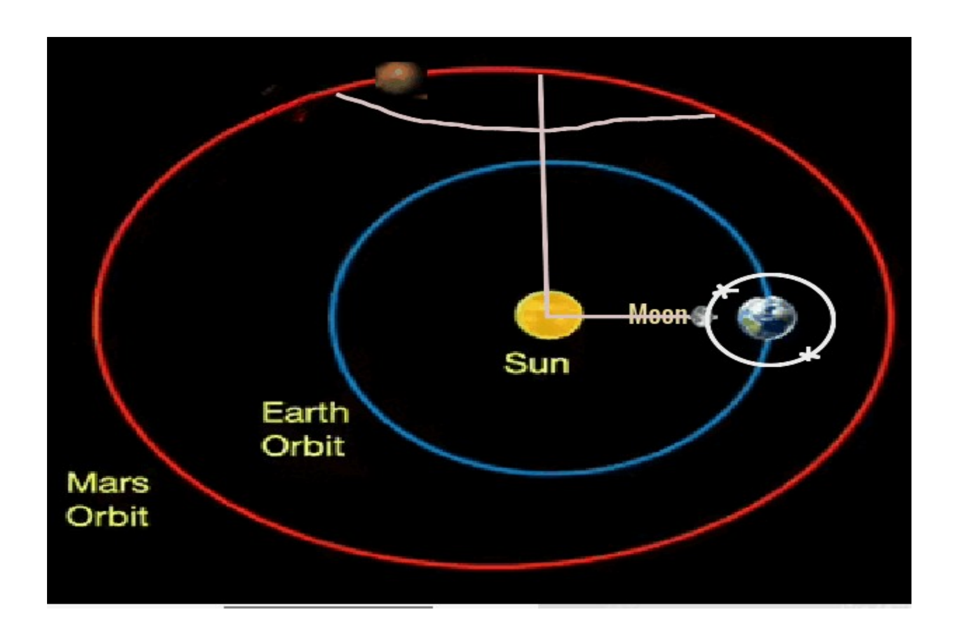
View Chart

Personalize your Chart

Name Today Month Oct Day 20 Year 1979 Vibe 1 Event

Here is how this configuration appeared in the sky





On May 13, 1982, a massive storm caused flooding in the Middle East. Here is the chart, notice that we have a similar dynamic as the first graphic, but this time where the moon is within 30 degrees of the lunar node forming a near right angle to Mars.

230529-0743 | Today, 05/13/1982 02:00:00 PM , style 1 harmonic

The Planets
- ⊕ Earth
- ☽ Moon
- ☉ Sun
- ☿ Mercury
- ♀ Venus
- ♂ Mars
- ♃ Jupiter
- ♄ Saturn
- ♅ Uranus
- ♆ Neptune
- ♇ Pluto

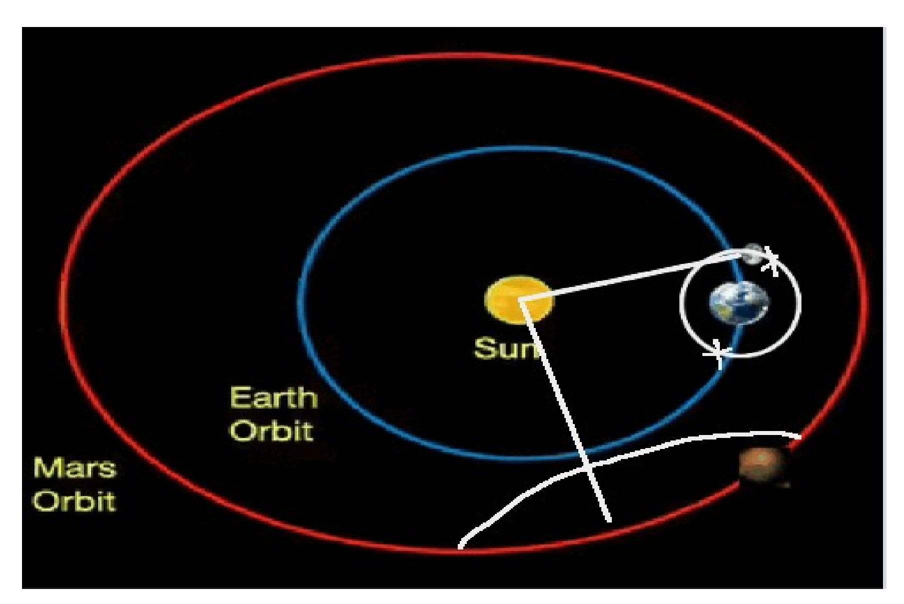
The Signs
- ♈ Aries
- ♉ Taurus
- ♊ Gemini
- ♋ Cancer
- ♌ Leo
- ♍ Virgo
- ♎ Libra
- ♏ Scorpio
- ♐ Sagittarius
- ♑ Capricorn
- ♒ Aquarius
- ♓ Pisces

View Chart

Personalize your Chart

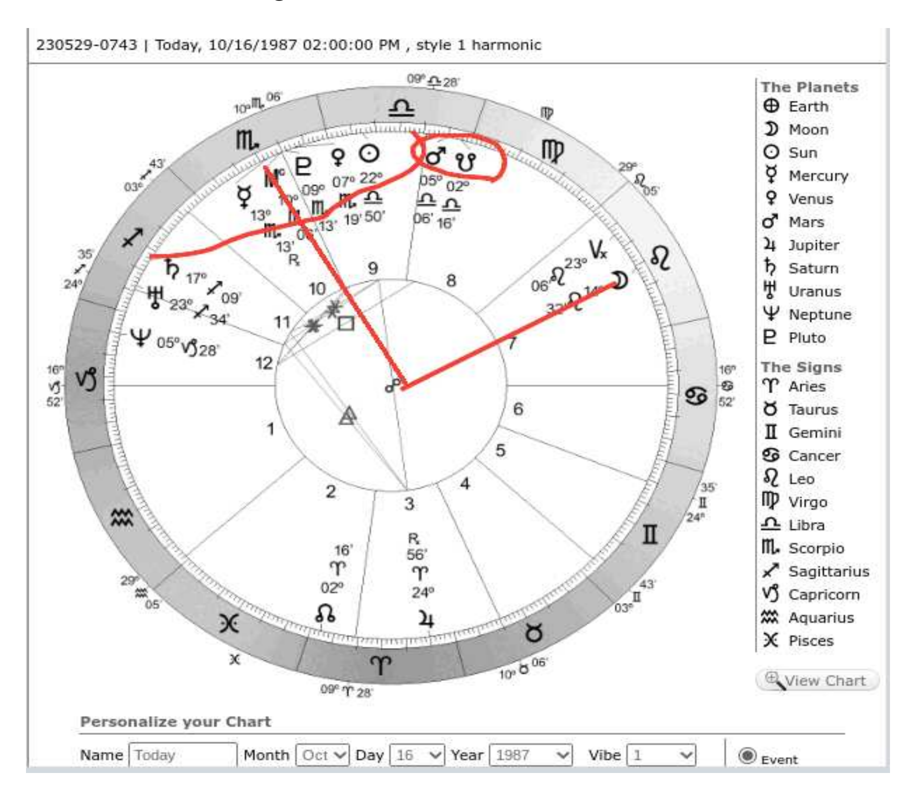
Name Today Month May Day 13 Year 1982 Vibe 1 Event

Here is how this configuration appeared in the sky on that day

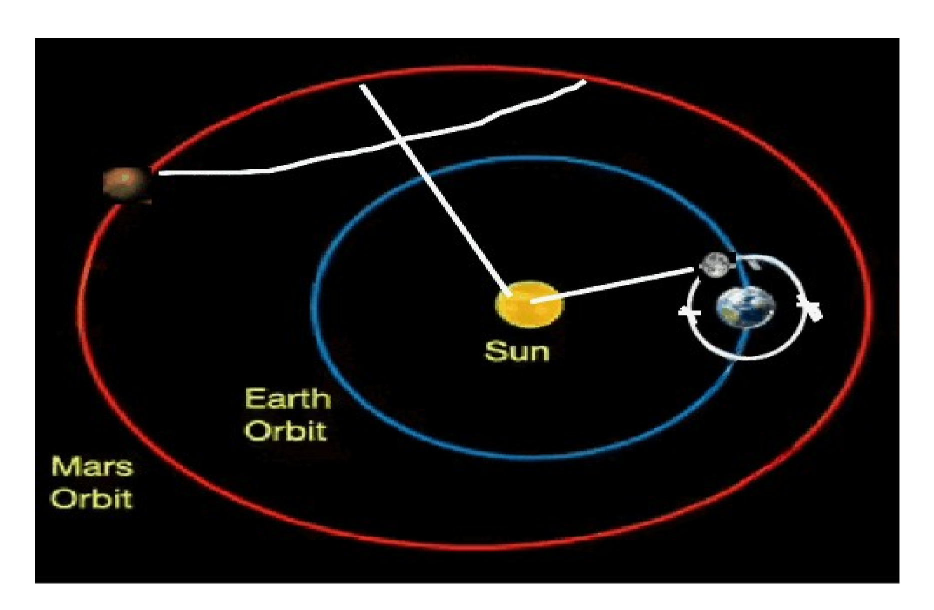


Notice that Mars was within the bounds of the point marking off the right angle created between the configuration of Mars and the moon.

Here is the chart for the storm that occurred on October 16 1987 and affected Egypt and Jordan with flooding, which led to 39 casualties.



Mars is within 30 degrees of the lunar node and nearly forming a right angle with the moon, but slightly off at the time the chart was calculated. The moon would have been within the assigned range hours earlier. Here is how the configuration appeared in the sky that day



Another heavy precipitation date for Egypt, causing floods occurred on October 16 1988. Here is the astrology chart showing the position of Mars, moon, and the lunar node. Once again Mars was within 30 degrees of the lunar node and making a right angle with the moon

230529-0743 | Today, 10/16/1988 02:00:00 PM , style 1 harmonic

The Planets
⊕ Earth
☽ Moon
☉ Sun
☿ Mercury
♀ Venus
♂ Mars
♃ Jupiter
♄ Saturn
♅ Uranus
♆ Neptune
♇ Pluto

The Signs
♈ Aries
♉ Taurus
♊ Gemini
♋ Cancer
♌ Leo
♍ Virgo
♎ Libra
♏ Scorpio
♐ Sagittarius
♑ Capricorn
♒ Aquarius
♓ Pisces

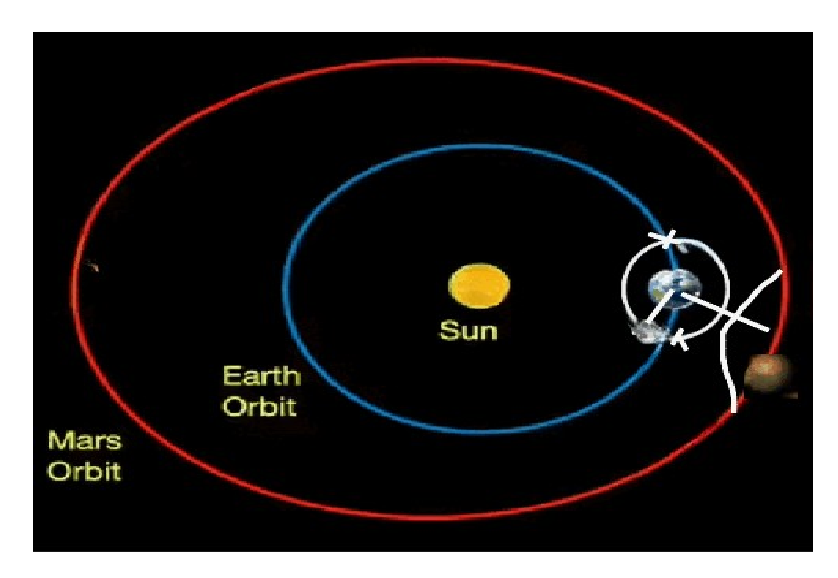
View Chart

Personalize your Chart

Name Today Month Oct Day 16 Year 1988 Vibe 1

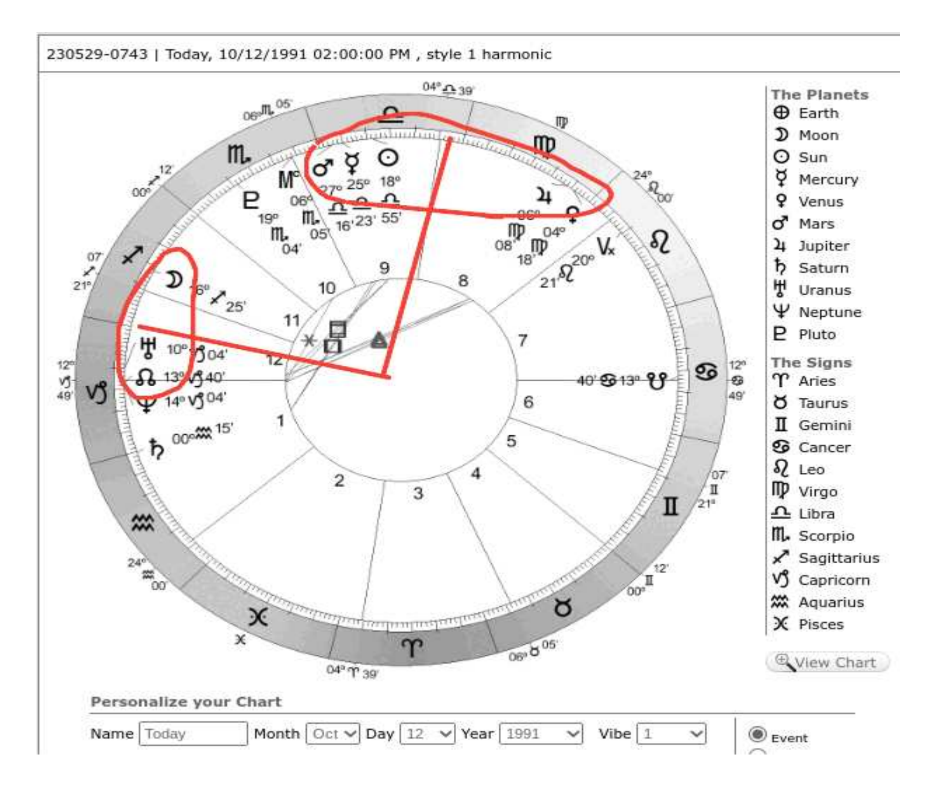
Event

Here is how the configuration appeared in the sky that day

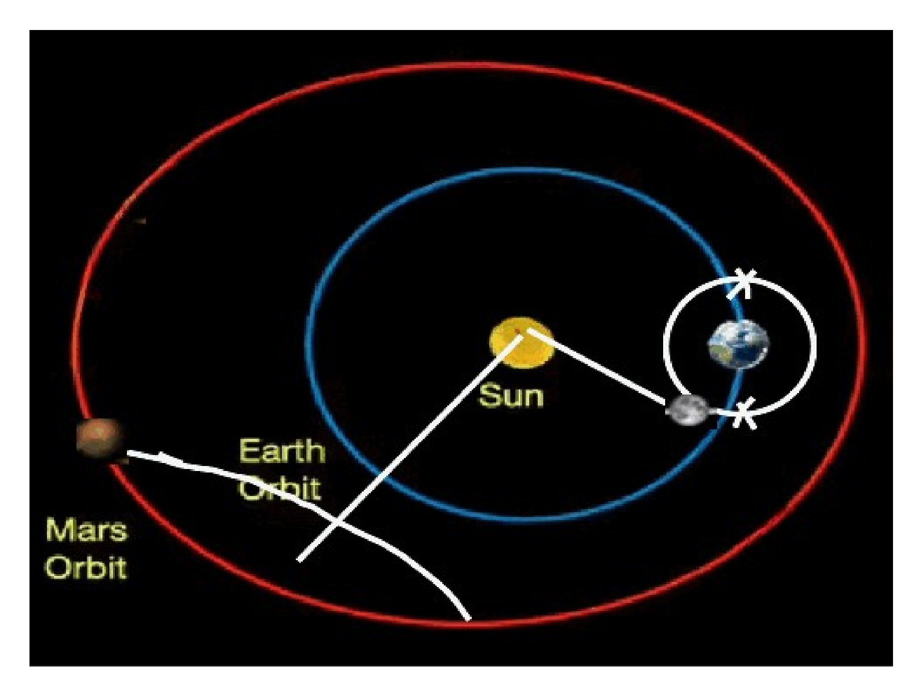


In the sky, the configuration forms a right angle

Another major precipitation event in the levant occurred on October 12, 1991. Here the moon was within 30 degrees of the lunar node and making a near right angle with Mars



Here is how the configuration appeared in the sky



The next major precipitation event in the Levant occurred on December 20 1993. During this time, there were 2 casualties and 10 million in damages in Israel's

In the astrology, Mars was within 30 degrees of the lunar node and making a right angle with the moon, which seems to be a typical configuration for extreme events.

230529-0743 | Today, 12/20/1993 02:00:00 PM , style 1 harmonic

The Planets
⊕ Earth
☽ Moon
☉ Sun
☿ Mercury
♀ Venus
♂ Mars
♃ Jupiter
♄ Saturn
♅ Uranus
♆ Neptune
♇ Pluto

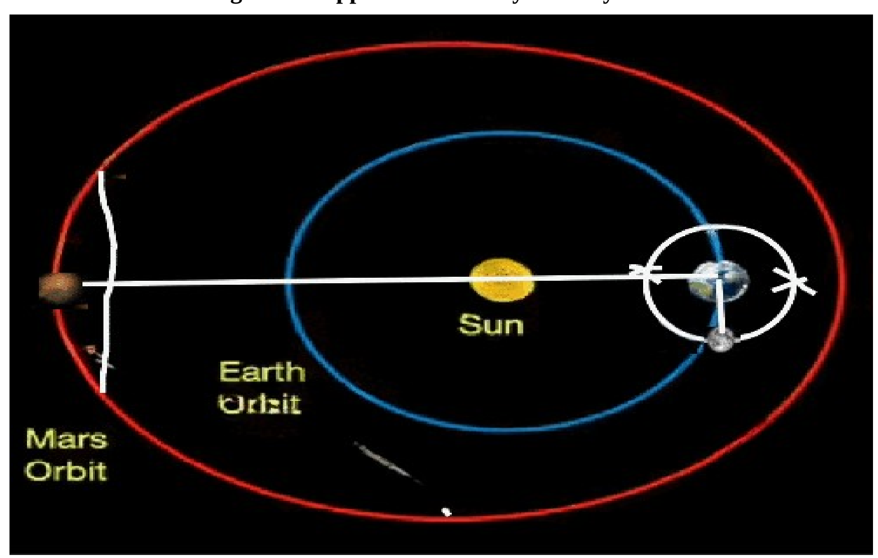
The Signs
♈ Aries
♉ Taurus
♊ Gemini
♋ Cancer
♌ Leo
♍ Virgo
♎ Libra
♏ Scorpio
♐ Sagittarius
♑ Capricorn
♒ Aquarius
♓ Pisces

View Chart

Personalize your Chart

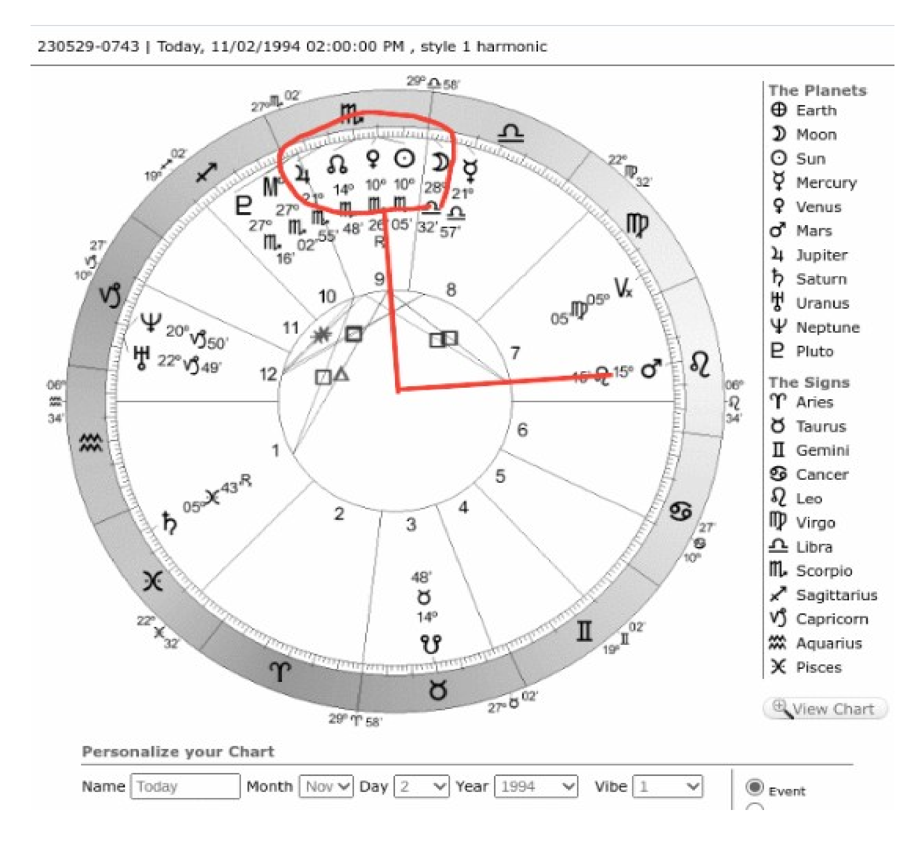
Name Today Month Dec Day 20 Year 1993 Vibe 1 Event

Here is how this configuration appeared in the sky that day

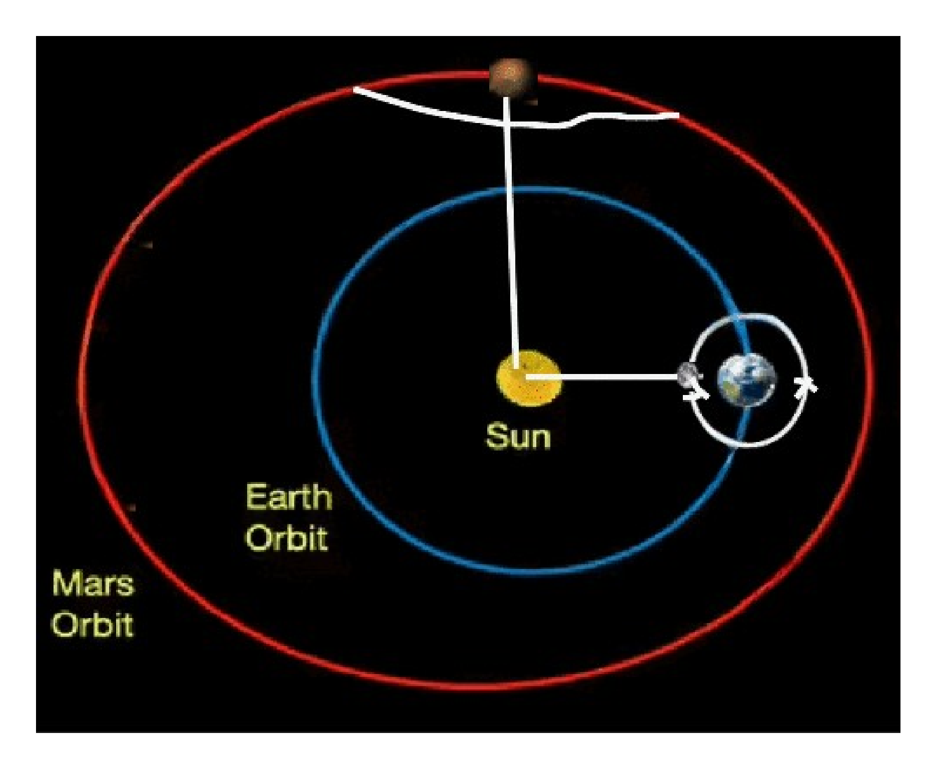


On November 2 of 1994, Egypt was afflicted by extreme flooding which led to 600 casualties and affect 160,000 people, costing 140 million in damages.

During this time, the moon was within 30 degrees of the lunar node and making a right angle with Mars. So once again we see this common pattern in extreme events, with either Mars or moon being within 30 degrees of the lunar node and forming a right angle to the other.



Here is how that configuration appeared in the sky that day



From November 13th to November 18th of 1996, a torrential rains in Egypt resulted in 12 casualties, with 260 people affected by floods. Mars had just began its phase of going within 30 degrees of the lunar node and made a right angle with the moon. Here is the astrology chart

230529-0743 | Today, 11/13/1996 02:00:00 PM , style 1 harmonic

The Planets
⊕ Earth
☽ Moon
☉ Sun
☿ Mercury
♀ Venus
♂ Mars
♃ Jupiter
♄ Saturn
♅ Uranus
♆ Neptune
♇ Pluto

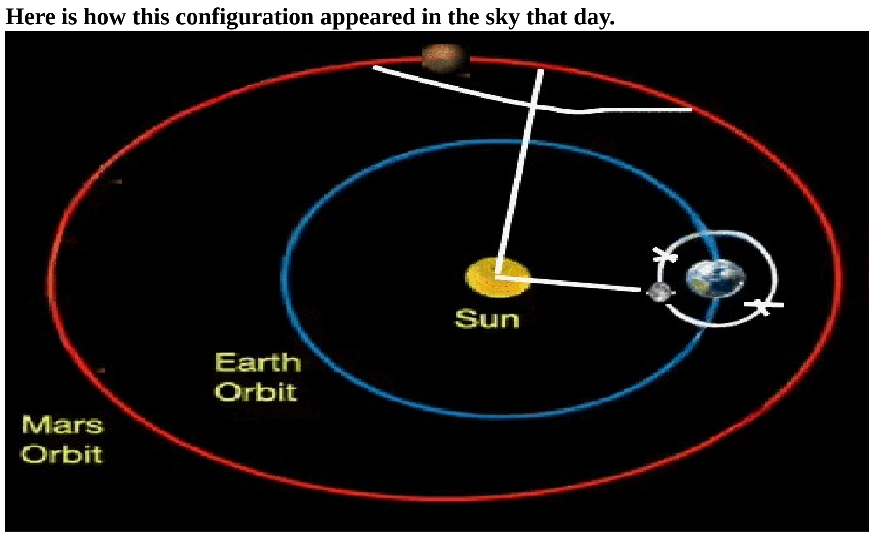
The Signs
♈ Aries
♉ Taurus
♊ Gemini
♋ Cancer
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♍ Virgo
♎ Libra
♏ Scorpio
♐ Sagittarius
♑ Capricorn
♒ Aquarius
♓ Pisces

View Chart

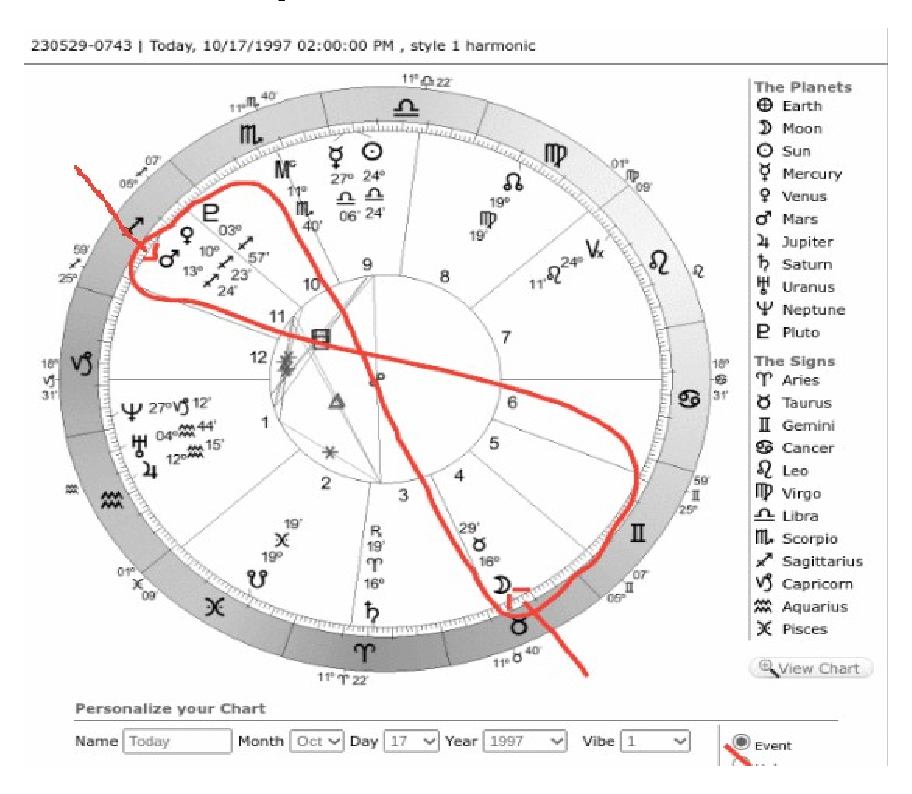
Personalize your Chart

Name Today Month Nov Day 13 Year 1996 Vibe 1 Event

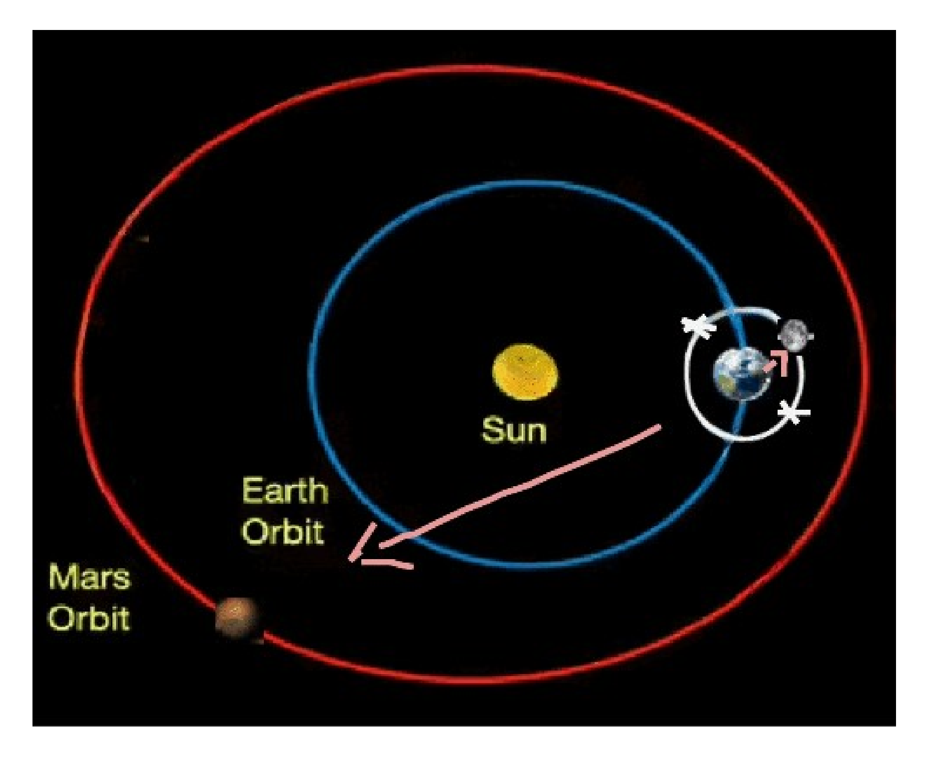
Here is how this configuration appeared in the sky that day.



On October 17 1997, heavy rains afflicted Egypt, Israel and Jordan. There were 15 casualties in Israel, Egypt and Jordan, with over 40 million dollars worth of damage. Here is the astrology chart. Here is an example where neither Mars nor the mon were within 30 degrees of the lunar node. This is an example where the moon and Mars where in opposition with each body tugging on Earth's axial tilt, which likely created a temperature perturbation. This is an example of a dynamic by which routine rainfall could be predicted



Here is how this configuration appeared in the sky



The best explanation as to why Mars within 30 degrees of the lunar node, forming a right angle with the moon, is a catalyst for extreme precipitation events could be due to how this configuration indicates that the moon is traveling along its orbital path furthest from the ecliptic plane. This is not to be confused with apogee and perigee when the moon is respectively furthest and closest to earth in its orbital path. The moon's orbit around the earth is tilted five degrees from the ecliptic and only meets with the ecliptic at the lunar nodes. Yet, during perigee(moon closest to earth) and apogee(moon furthest from earth), the moon is very close to the lunar nodes. So in this regard, we have to observe the moon relative to the ecliptic plane and why its proximity from such is a factor contributing to temperature perturbations and rainfall. We can surmise that when the moon is furthest off the ecliptic plane as Mars gets closer to the lunar nodes, temperature perturbations occur as a consequence of the moon's waning gravitational pull on the earth during this period, allowing Mars to exert its gravitational influence with less opposition from the moon. This could bring in humidity and moisture that would immediately precipitate if it merges with cooler air, assuming this happens during the winter.

This next chart is for January 22 2005. Between the 22 and 27, torrential rain led to 29 casualties in the Middle East. Here is the chart. Mars and the moon are in opposition

230529-0743 | Today, 01/22/2005 02:00:00 PM , style 1 harmonic

The Planets
⊕ Earth
☽ Moon
☉ Sun
☿ Mercury
♀ Venus
♂ Mars
♃ Jupiter
♄ Saturn
♅ Uranus
♆ Neptune
♇ Pluto

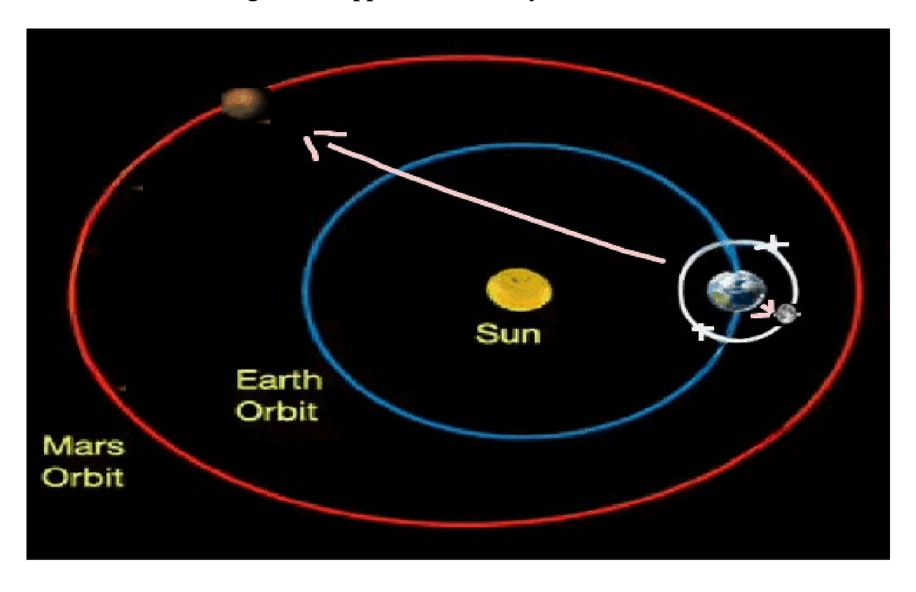
The Signs
♈ Aries
♉ Taurus
♊ Gemini
♋ Cancer
♌ Leo
♍ Virgo
♎ Libra
♏ Scorpio
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♑ Capricorn
♒ Aquarius
♓ Pisces

View Chart

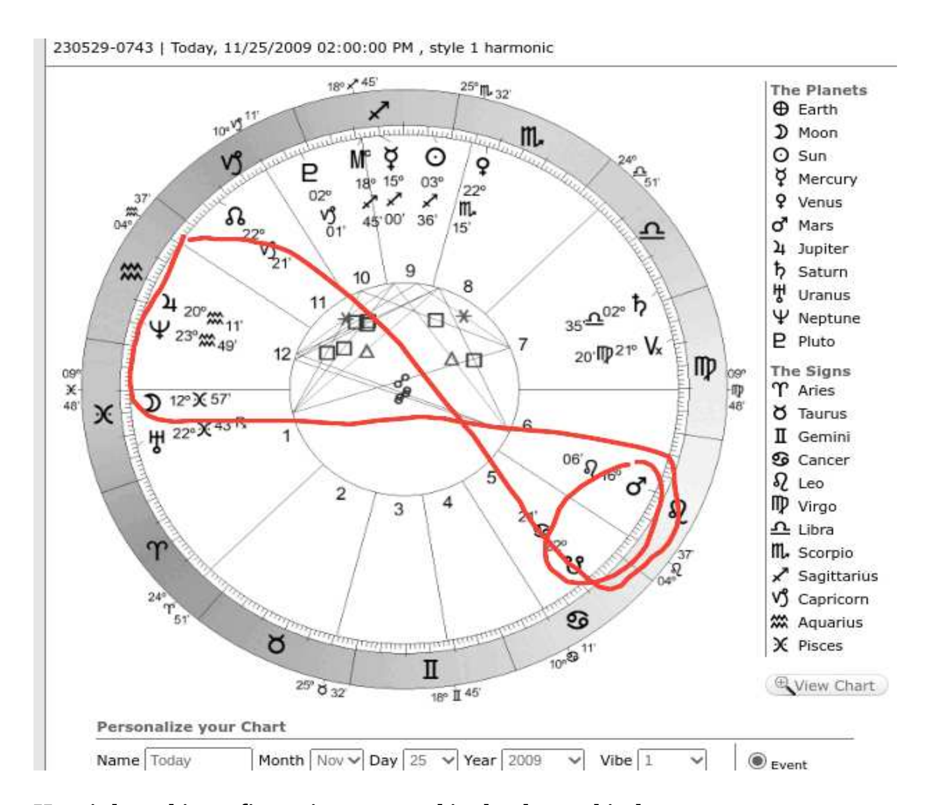
Personalize your Chart

Name Today Month Jan Day 22 Year 2005 Vibe 1 Event

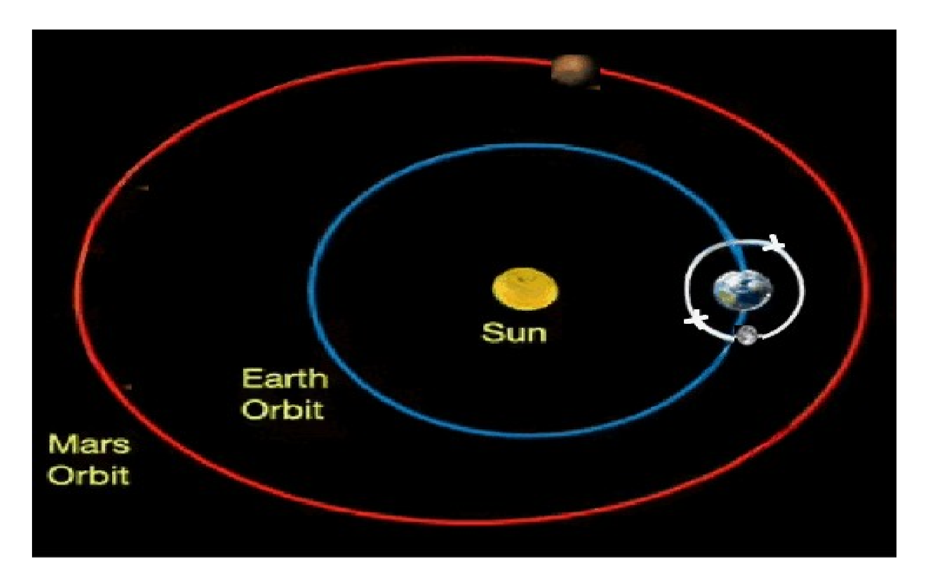
Here is how this configuration appeared in the sky



This next chart is for November 25, 2009, a day which led to massive flooding in Saudi Arabia, leading to 122 fatalities. 10,000 people affected, with an estimated 900 million dollars in damage. Mars is within 30 degrees of the lunar node, but the moon is not forming the angle expected for such an event like this one. The moon is opposite Mars, exerting an opposing effect on Mars's gravitational pull.



Here is how this configuration appeared in the sky on this day



This is the chart for May 2, 2013, when rainfall and flooding led to 20 casualties in the Middle east. This chart shows Mars within 30 degrees of the lunar node forming a right angle with the moon.

230529-0743 | Today, 05/02/2013 02:00:00 PM , style 1 harmonic

The Planets
⊕ Earth
☽ Moon
☉ Sun
☿ Mercury
♀ Venus
♂ Mars
♃ Jupiter
♄ Saturn
♅ Uranus
♆ Neptune
♇ Pluto

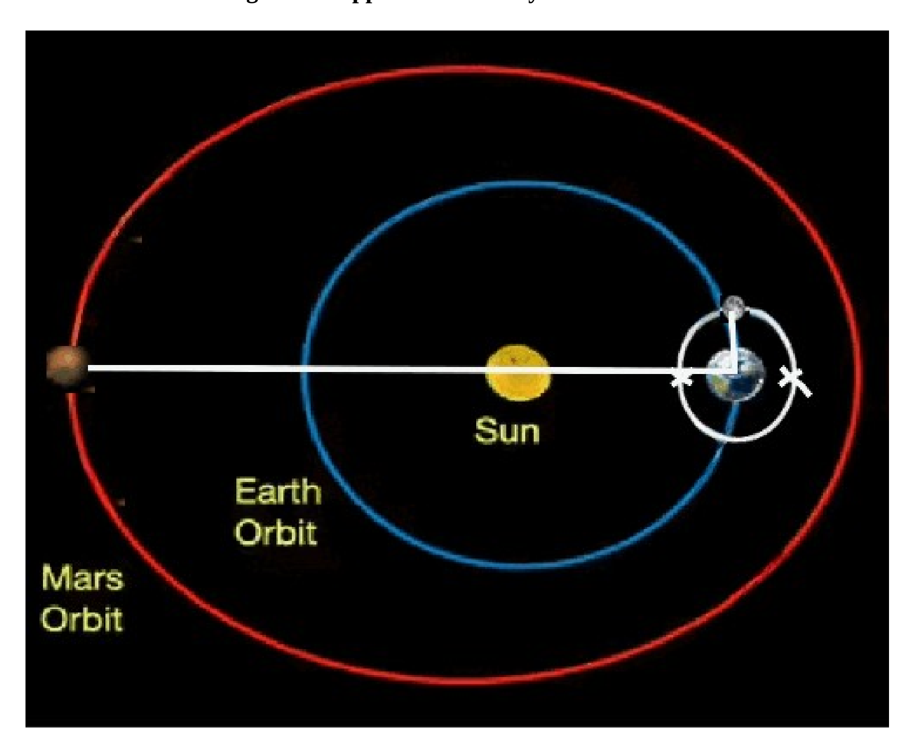
The Signs
♈ Aries
♉ Taurus
♊ Gemini
♋ Cancer
♌ Leo
♍ Virgo
♎ Libra
♏ Scorpio
♐ Sagittarius
♑ Capricorn
♒ Aquarius
♓ Pisces

View Chart

Personalize your Chart

Name Today Month May Day 2 Year 2013 Vibe 1 Event

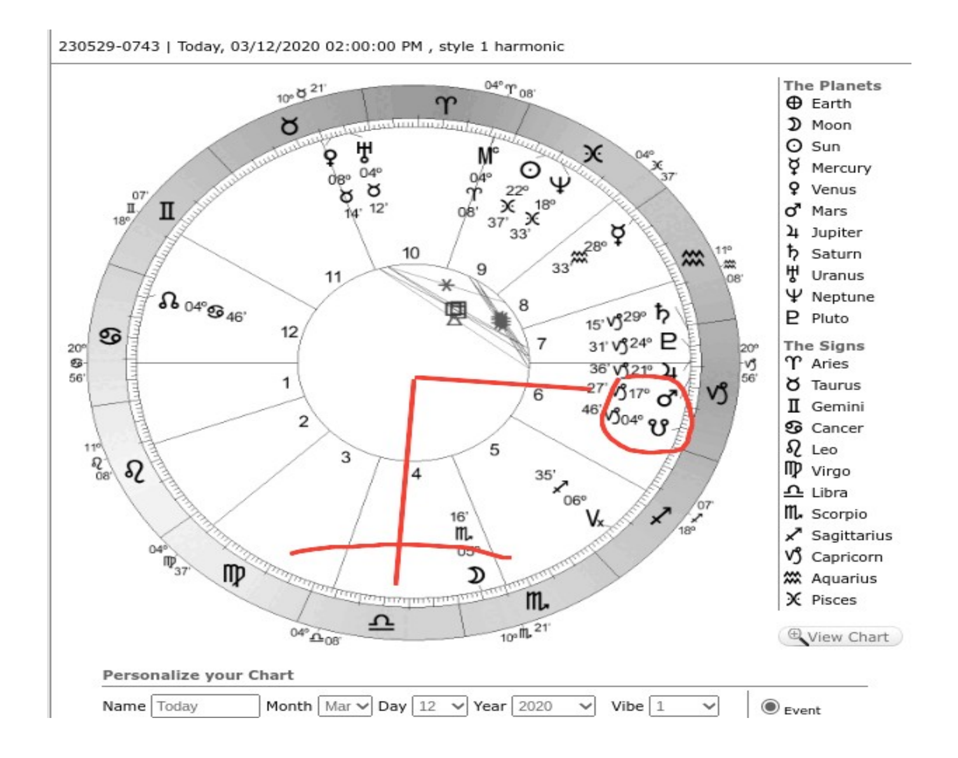
Here is how this configuration appeared in the sky



In 7 of 12 of the listed charts for heavy precipitation in the Middle East, Mars was within 30 degrees of the lunar node. Based on that alignment, farmers in the Middle East could use it to develop decisive protocols on how to efficiently allocate water resources and commence fertilizer and cropping activities.

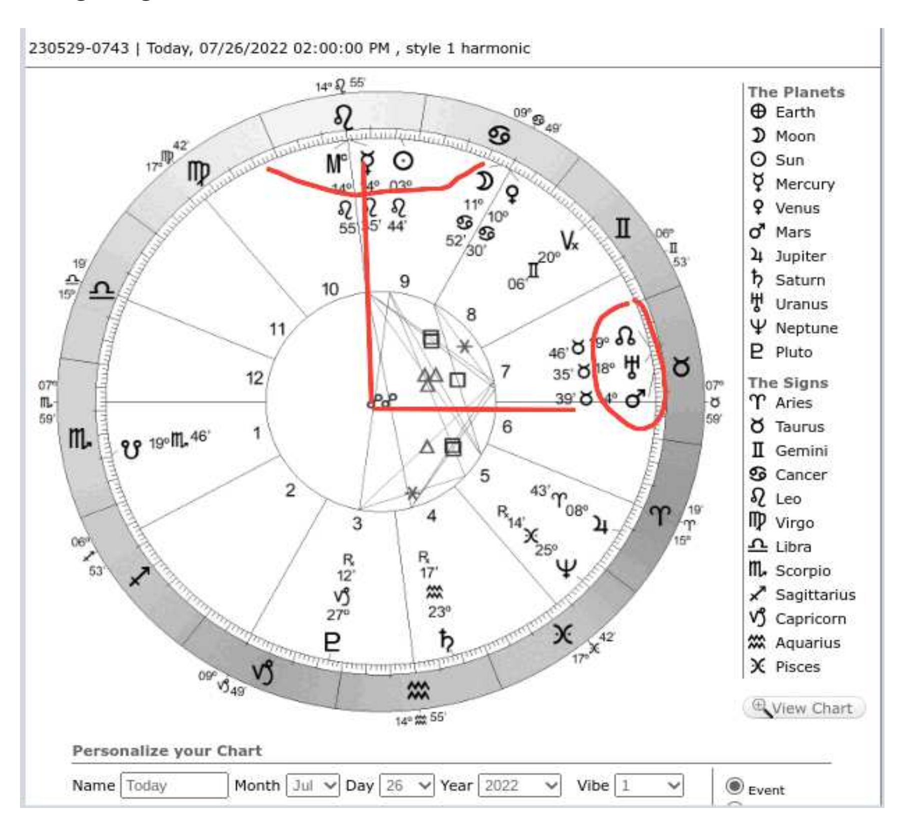
Here are examples of four major storms and floods in last five years in the Middle east.

Here is the chart for March 12, 2020, during which major rainfall and floding struck the Middle East. Nine countries were affected—Egypt, Jordan, Israel, Syria, Lebanon, Turkey, Saudi Arabia, Sudan, Iran and Iraq. Mars was within 30 degrees at this time, making a right angle to the moon. This was Egypt's worst storm since 1979, during which Mars was also within 30 degrees of the lunar node.

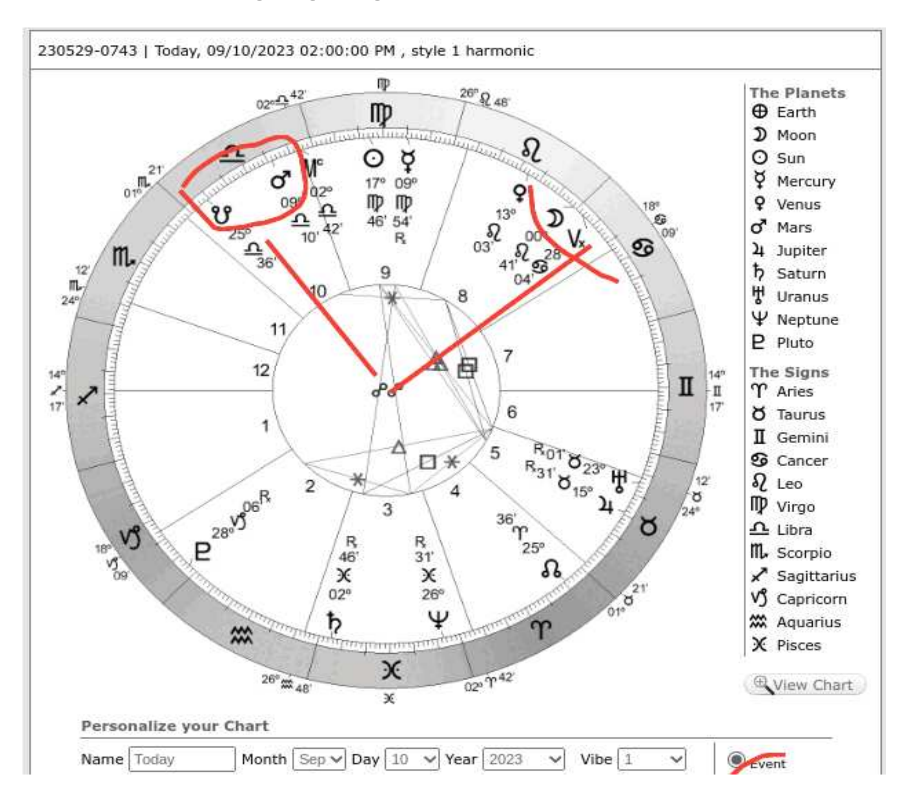


Here is the chart for July 26 2022, during which the United Arab Emirates experienced record breaking rainfall.

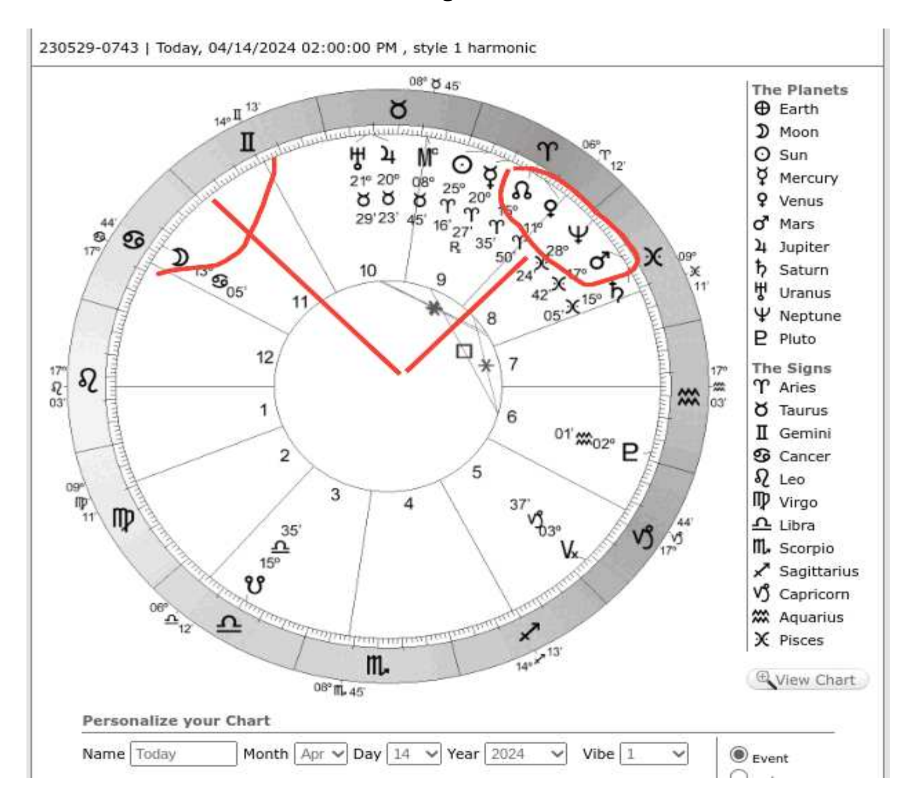
Once again, on this day Mars was within 30 degrees of the lunar node, forming a near right angle with the moon at the start. Within hours, the moon would be within the right angle zone



Here is the chart for the 2023 Libya floods, brought on by Storm Daniel, which struck Libya on September 10th 2023. On this day, Mars was within 30 degrees of the lunar node, forming a right angle with the moon



Here is the chart for the United Arab Emirates floods in April of 2024. Heavy rains struck the UAE on April 14th 2024 and caused major flooding. The United Arab Emirates, Oman, Iran, Bahrain, Qatar, Saudi Arabia, Yemen were all affected. This was a record breaking event for the UAE. Once again, Mars was within 30 degrees of the lunar node, forming a right angle with the moon when the storm made landfall there. This was a record breaking event for the UAE

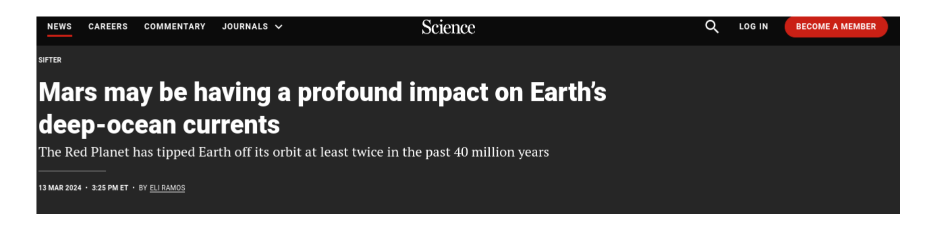


The only extrapolation we can gather for this data is that Mars within 30 degrees of the lunar node may be responsible for above average rainfall in a given season. Here, we can devise a system that could predict heavy rainfall and thus help everyone in the Middle East with emergency response protocols and agricultural timing related to crop growth and development. In irrigated agriculture, the amount of rainfall determines the amount of irrigation water and its consumption time. Rainfall-based systems look to the timing of rainfall to determine crop growth. This also translates into the timing of fertilizer, herbicide and pest control applications. Rainfall is also key to timing harvest operations for post-harvest activities. Forecasting weather events helps in planning farm tasks, planting or not, determining whether to irrigate or not to use fertilizer, transportation and storage of food grains, and measures to protect livestock. In general, a successful weather

forecasting system contributes to the decision-making process of agricultural practices

Keep in mind that the premise for the Mars factor was affirmed in 2024, when scientists began to hypothesize that Mars influences Earth's climate and ocean tides.

Here is an article from Science.org



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Mars may be having a profound impact on Earth's deep-ocean currents

The Red Planet has tipped Earth off its orbit at least twice in the past 40 million years

13 MAR 2024 • 3:25 PM ET • BY ELI RAMOS

“The moon causes tides, but it's not the only celestial body that affects Earth's water. Mars' gravity affects our planet's deep ocean currents, according to a study published this week in the journal Nature Communications.”

Other papers support the hypothesis that Mars must have some influence on Earth. In this section, I combined this dynamic with the scientific premise that the moon has influence over the amount of rainfall via its gravitational pull on earth’s atmosphere.

On the next page is an example(sources used) of the dates when the Middle East was exposed to heavy rains, floods and human casualties. The dates are taken from a study that examined the dynamics of extreme rainfall events in the Levant and the Middle East. Source: Extreme Precipitation Events in the Middle East: Dynamics of the Active Red Sea Basin AJ de Vries, E. Tyrlis, D. Edry, S. o . Krishak, B. Steele, J. Lilyfeld. First published: 12 June 2013 https://doi.org/10.1002/jgrd.50569

Nr.	Years and Months	Days	Sources of Motivation [a]	Societal Impact	Case Studies
1	Oct 1979	20–23	1,2	50 casualties, 66,000 people affected, and US$ 14 M damage in Egypt (flood) [b]	
2	May 1982	13			
3	Oct 1987	16–18	1,2	30 casualties in Egypt (storm on 17 Oct) and nine casualties in Jordan (flood on 16 Oct) [b]	
4	Oct 1988	16–19	1		
5	Oct 1991	12–14	1,2,3		*Greenbaum et al.* [1998]
6	Dec 1993	20–23	3	two casualties and estimated damage US$ 10 M in Israel [c]	*Ziv et al.* [2005]
7	Oct 1994	10	1,2		
8	Nov 1994	2–4	1,2,3	600 casualties,160,660 people affected, and US$ 140 M damage in Egypt (flood, 2–8 Nov) [b]	*Krichak and Alpert* [1998], *Krichak et al.* [2000]
9	Nov 1996	16–18		12 casualties and 260 people affected in Egypt (flood, 13–18 Nov) [b]	
10	Oct 1997	17–19	1,2,3	15 casualties and US$ 40 M damage in Israel (flood from 17 to 19 October), four casualties, and US$ 1 M damage in Egypt (flood, 18–20 Oct) and two casualties and US$ 1 M damage in Jordan (flood, 18–20 Oct) [b]; at least six casualties in Egypt, nine in Israel, and two in Jordan [c]	*Dayan et al.* [2001]
11	Nov 2003	23–25			
12	Oct 2004	28–29	3		*Greenbaum et al.* [2010]